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The genus *Ananteris* Thorell, 1891 (Scorpiones, Buthidae) in southeast Brazil, with the description of three new species

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Abstract

A new synthesis of the geographical distribution of the genus *Ananteris* Thorell, 1891 (Scorpiones, Buthidae) in Brazil is proposed. Three new species, *Ananteris chagasi* **sp. n.**, *Ananteris kuryi* **sp. n.**, and *Ananteris bernabei* **sp. n.** are described from the States of Bahia, Espírito Santo and Minas Gerais. Only isolated records of *Ananteris* species where known up to now, for the States of Minas Gerais and Bahia. The record of an *Ananteris* species from the State of Espirito Santo is new. The total number of *Ananteris* species is now raised to 67 and from this, 16 species are found in Brazil. The geographical distribution of the genus is considerably enlarged in the country.

Keywords

Scorpion, Buthidae, *Ananteris*, new species, geographical distribution, Brazil.

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Introduction

As already explained in recent publications (Lourenço 2003, 2004a,b; Lourenço et al. 2006), since the genus *Ananteris* Thorell, 1891 was last revised (Lourenço 1982) the number of species described in it has increased continuously. It now contains 67 known species (see Lourenço 2001, 2003, 2004a,b; Lourenço et al. 2006; Rojas-Runjaic and De Sousa 2007; Botero-Trujillo 2007, 2009; Rojas-Runjaic et al. 2008). Several recently described species, however, require a revision of their taxonomic status. This is particularly true for the 26 species recently described by González-Sponga (2006) from Venezuela. Such a revision is not, however, the aim of this publication.

During a revision of the genus (Lourenço 1982), several new species from Brazil were described in addition to *Ananteris balzanii* Thorell, the only species known from the country before that date. These species were: *Ananteris dekeyseri* Lourenço, *Ananteris franckei* Lourenço, *Ananteris mariaterezae* Lourenço, *Ananteris maury* Lourenço and *Ananteris pydanieli* Lourenço. Subsequently Lourenço (1984) described *Ananteris luciae* Lourenço, followed by *Ananteris maranhensis* Lourenço (Lourenço 1987) and *Ananteris deniseae* Lourenço (Lourenço 1997, 2002). More recently, other species have been described. *Ananteris nairae* (Lourenço 2004a) was described from the West of the State Amazonas, showing the most westerly distribution of all Brazilian species in the genus. This was followed by the descriptions of *Ananteris evellynae* Lourenço, 2004, from the State of Bahia, *Ananteris cryptozoicus* Lourenço, 2005, also from Amazonia and *Ananteris cachimboensis* Lourenço, Motta & Silva, 2006 from the State of Mato Grosso (Lourenço 2004a,b; Lourenço 2005; Lourenço et al. 2006). The recent examination of several scorpions belonging to the genus *Ananteris*, collected in the States of Bahia, Espírito Santo and Minas Gerais, has revealed the presence of three new species. These are described here. Only isolated records of *Ananteris* species where known, for the States of Minas Gerais and Bahia. The record of an *Ananteris* species for the State of Espírito Santo is, however, new. The total number of *Ananteris* species is now raised to 67 and from this, 16 species are found in Brazil. The geographical distribution of the genus is considerably enlarged in the country.

Methods

Illustrations and measurements were produced using a Wild M8 stereo-microscope with a drawing tube and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974), while morphological terminology mostly follows Vachon (1952) and Hjelle (1990).

Checklist of the known *Ananteris* species in Brazil

1. *Ananteris balzanii* Thorell, 1891. Argentina, Brazil (Paraná, São Paulo, Minas Gerais, Mato Grosso, Mato Grosso do Sul, Goiás, Pará), Paraguay

2. ***Ananteris bernabei* sp. n. Brazil (Espírito Santo)**
3. *Ananteris cachimboensis* Lourenço, Motta & Silva, 2006.Brazil (Pará)
4. ***Ananteris chagasi* sp. n. Brazil (Minas Gerais)**
5. *Ananteris cryptozoicus* Lourenço, 2005. Brazil (Amazonas)
6. *Ananteris dekeyseri* Lourenço, 1982. Brazil (Amazonas)
7. *Ananteris deniseae* Lourenço, 1997. Brazil (Paraná)
8. *Ananteris evellynae* Lourenço, 2004. Brazil (Bahia)
9. *Ananteris franckei* Lourenço, 1982. Brazil (Pernambuco)
10. ***Ananteris kuryi* sp. n. Brazil (Bahia)**
11. *Ananteris luciae* Lourenço, 1984. Brazil (Pará)
12. *Ananteris maranhensis* Lourenço, 1987. Brazil (Maranhão)
13. *Ananteris mariaterezae* Lourenço, 1982. Brazil (Tocantins, Minas Gerais)
14. *Ananteris mauryi* Lourenço, 1982. Brazil (Pernanbuco, Rio Grande do Norte, Bahia)
15. *Ananteris nairae* Lourenço, 2004. Brazil (Amazonas)
16. *Ananteris pydanieli* Lourenço, 1982. Brazil (Amazonas)

Taxonomic treatment

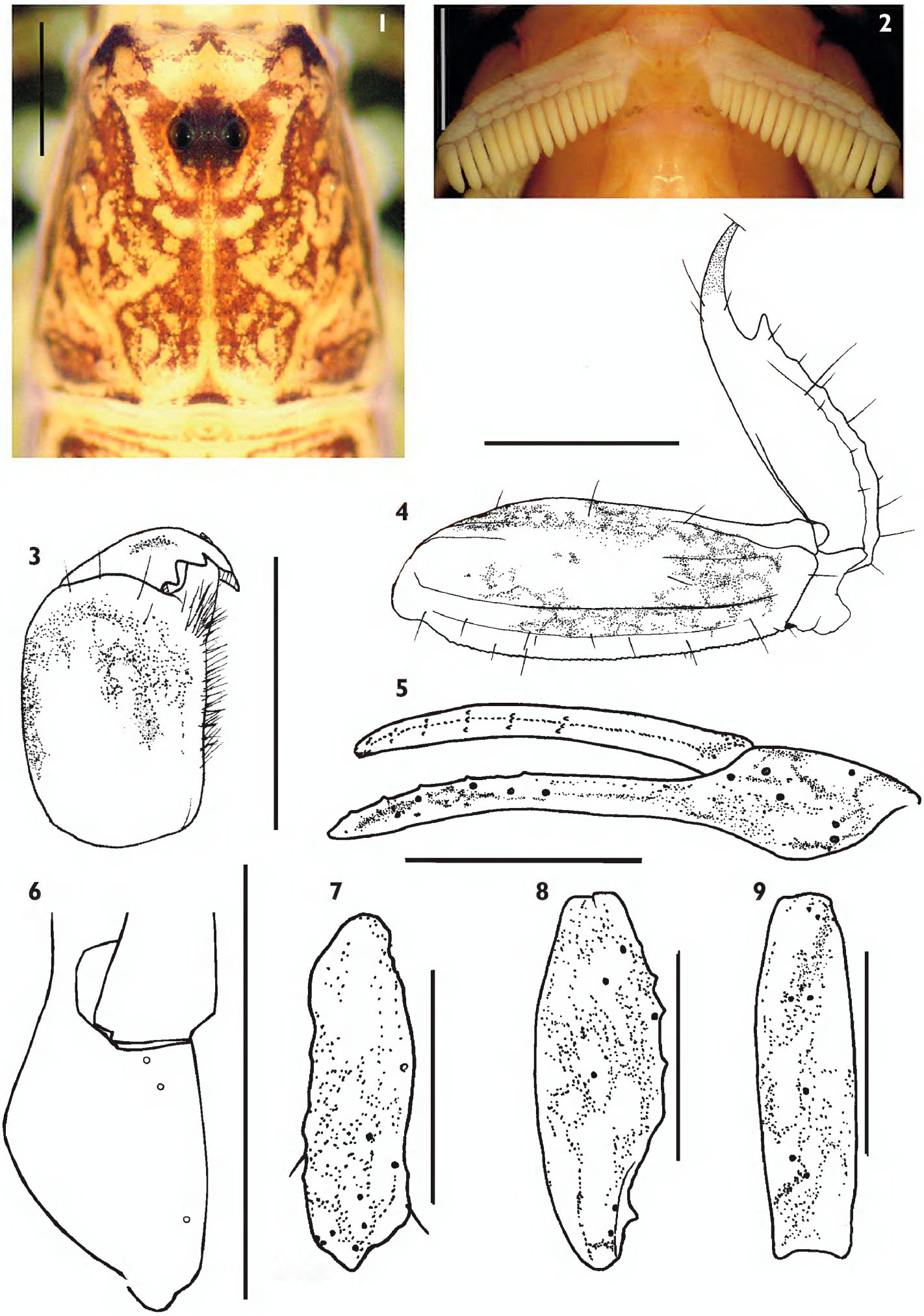
***Ananteris chagasi* sp. n.**
urn:lsid:zoobank.org:act:CBC97796-8CBD-4AFF-B9CC-95F4FFD3232C
Figs 1-9, 28

Type material. Holotype. Male. (sub-adult). Brazil, State of Minas Gerais, Itacarambi, around Olhos d'água cave (Giupponi, Chagas-Junior, Baptista, Silvia leg.), 26/V/2006. Deposited in the arachnological collection of the Museu Nacional, Rio de Janeiro, Brazil.

Diagnosis. Species of small to moderate size when compared with the average size of the other species of the genus (16.3 mm in total length; see Table I). General coloration yellowish with intense variegated dark pigmentation. Pedipalps short and slender; fingers with 6 rows of granules; male pectines with 15-15 teeth. The new species can be distinguished from other known species of the genus, and in particular from *A. balzanii*, which is also distributed in the State of Minas Gerais by: (i) a different pattern of pigmentation; fingers of pedipalp chela in *A. balzanii* are yellow, whereas these are very dark in the new species; chelicerae in *A. balzanii* are totally covered by reticular spots, whereas in the new species these cover only the anterior and lateral edges, (ii) pedipalp fingers with have 7 rows of granules in *A. balzanii*, against only 6 in the new species, (iii) male pectines with 15 teeth, in contrast to 16-19 in *A. balzanii*, (iv) some distinct morphometric values (see Table I). The new species is possibly an endemic element to the state of Minas Gerais.

Etymology. Patronym is in honor of Dr. Amazonas Chagas Júnior. of the Museu Nacional, Rio de Janeiro, Brazil.

Description. Based on male holotype (measurements in Table I).



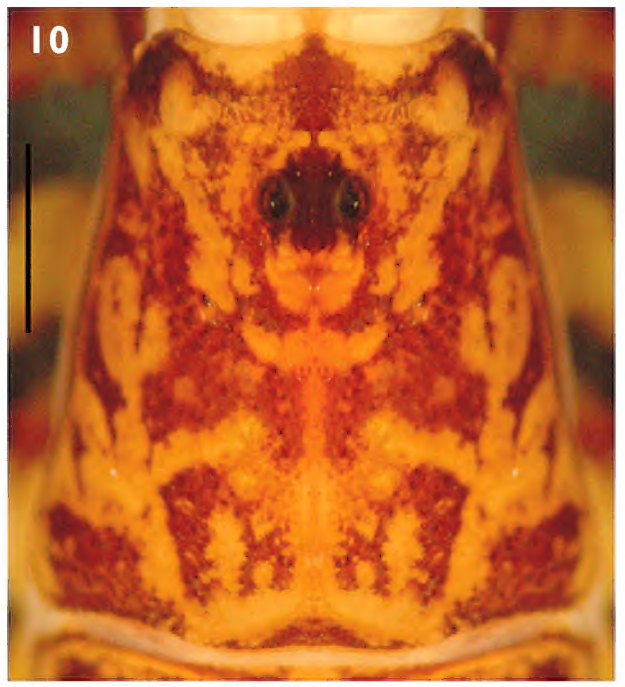
Figures 1-9. *Ananteris chagasi* sp. n., male holotype. **1** Carapace dorsal view. **2** Pectines. **3** Chelicera, dorsal view. **4** Metasoma, segments IV-V and telson, lateral view. **5** Chela, dorsal view. **6** Manus, ventral view. **7** Pedipalpal femur, dorsal view. **8-9** Pedipalpal patella, dorsal and external view. Scale bars: 1-4 and 6-9 = 1mm; 5 = 0.5 mm.

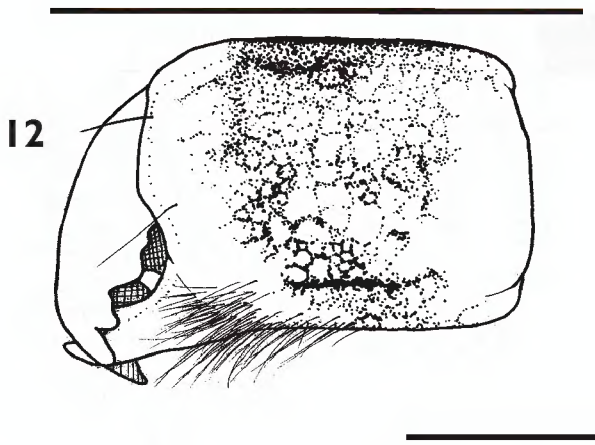
Coloration. Generally yellowish with dark brown to blackish pigmented zones on the body and its appendages. Prosoma: carapace yellowish with dark brown spots on the lateral and posterior edges; eyes surrounded by black pigment. Mesosoma: yellowish with confluent blackish zones on the posterior and lateral edges of tergites. Metasoma: segments I to V yellowish; all segments intensely marked with dark brown spots. Vesicle yellowish without spots; the base of the aculeus yellowish and the tip reddish. Venter yellowish; sternite VII with very diffused brownish spots. Chelicerae yellowish with variegated blackish spots over the anterior and lateral surfaces; fingers with blackish spots; teeth reddish. Pedipalps: yellowish; femur and patella with densely marked blackish-brown spots; chela hand almost entirely blackish-brown; fingers very dark. Legs yellowish, with several blackish-brown spots.

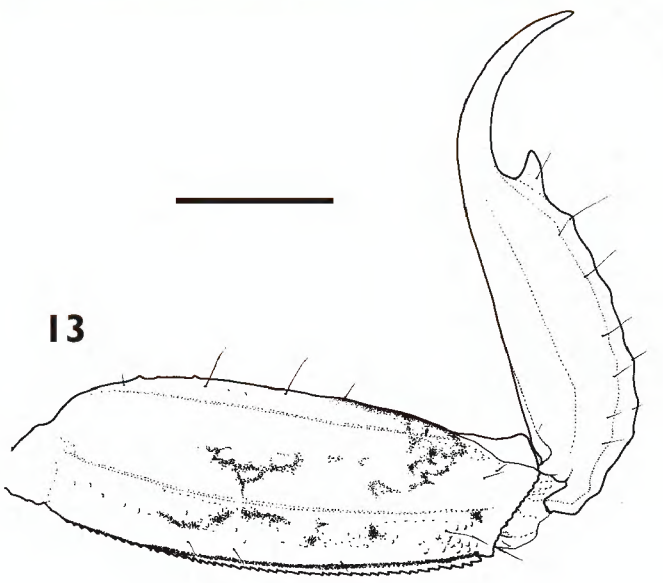
Morphology. Carapace with thin but intense granulation; anterior margin not emarginated, almost straight. Anterior median superciliary and posterior median carinae weak or absent. All furrows moderate to weak. Median ocular tubercle distinctly anterior to the centre of the carapace; median eyes separated by approximately one ocular diameter. Three pairs of lateral eyes. Sternum subpentagonal to pentagonal. Mesosoma: tergites with thin and sparse granulation. Median carina moderate to weak in all tergites. Tergite VII pentacarinate. Venter: genital operculum divided longitudinally, each plate more or less subtriangular in shape. Pectines: pectinal tooth count 15-15; basal middle lamellae of the pectines not dilated; fulcra absent. Sternites smooth; stigmata weakly elongate; setation moderate; sternite VII with very weakly marked carinae. Metasoma: segments I and II with 10 carinae, moderately crenulate. Segments III and IV with 8 carinae, moderately crenulate. Intercarinal spaces slightly granular, almost smooth. Segment V slightly rounded with 5 carinae. Telson moderately elongated and without granulations; with one ventral carina weakly marked; aculeus short and weakly curved; subaculear tooth strong and spinoid. Cheliceral dentition characteristic of the family Buthidae (Vachon 1963); fixed finger with two moderate basal teeth; movable finger with two weak basal teeth; ventral aspect of both finger and manus with dense, long setae. Pedipalps: femur pentacarinate; patella and chela with weak to vestigial carinae; internal face of patella with 5 minute spinoid granules; all faces slightly granular, almost smooth. Fixed and movable fingers with 6 almost linear rows of granules; two small external and one internal accessory granule present at the base of each row; three granules in the extremity of the fingers; Trichobothriotaxy; orthobothriotaxy A-ß-beta (Vachon 1974, 1975). Legs: tarsus with very numerous fine median setae ventrally. Tibial spurs moderately developed on leg IV; weak on leg III.

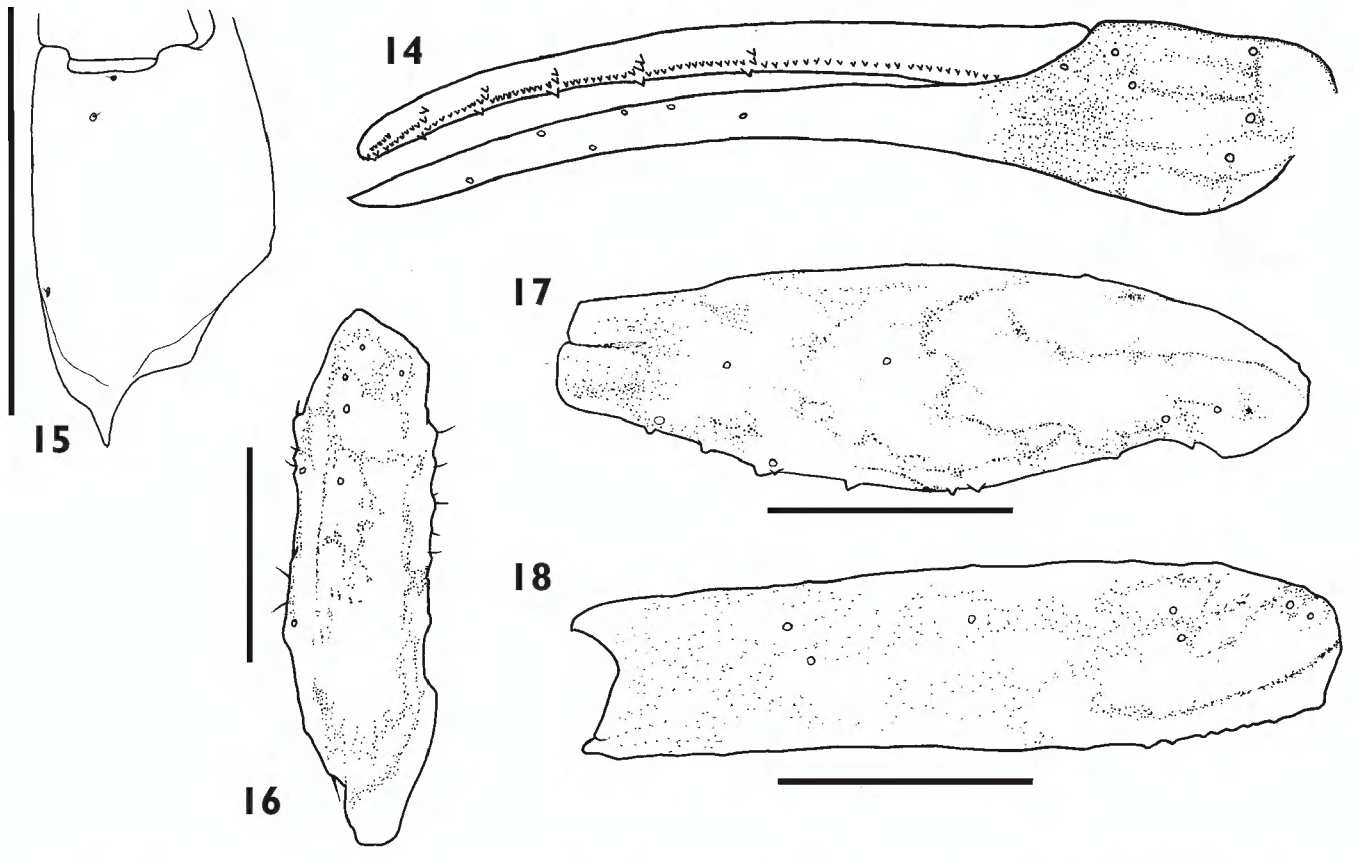
***Ananteris kuryi* sp. n.**
urn:lsid:zoobank.org:act:4C22C8A5-D0C9-43B2-88B0-F75C4769B666
Figs 10-18, 28

Type material. Holotype. Female. Brazil, State of Bahia, Porto Seguro, Arraial d'Ajuda (16°27 643' S – 039° 08 298' W, 24-27/II/2005 (Expedição Arachné). Deposited in the arachnological collection of the Museu Nacional, Rio de Janeiro, Brazil (MNRJ-11344). Paratypes, 2 females, Bahia, Porto Seguro, Trancoso, 18-19/VI/2005









Figures 10-18. *Ananteris kuryi* sp. n., male holotype. **10** Carapace dorsal view. **11** Pectines. **12** Chelicera, dorsal view. **13** Metasoma, segments IV-V and telson, lateral view. **14** Chela, dorsal view. **15** Manus, ventral view. **16** Pedipalpal femur, dorsal view. **17-18** Pedipalpal patella, dorsal and external view. Scale bars: 1mm.

(A. Chagas Jr., B. Segal, E.G. Vasconcelos) (MNRJ-11343). One paratype deposited in the Muséum national d'Histoire naturelle, Paris.

Diagnosis. Species of small to moderate size when compared with the average size of the other species of the genus (19.9 mm in total length; see Table I). General coloration yellowish with variegated dark pigmentation. Pedipalps very slender; fingers with 6 rows of granules; female pectines with 13-14 teeth. The new species can be distinguished from other known species of the genus from the Atlantic forest region of Brazil, and in particular from *A. mauryi*, which is also distributed in the State of Bahia by: (i) a less dark pigmentation of the body and appendages; chelicerae in the new species are totally covered by reticular pigmentation, whereas in *A. mauryi* these cover only the anterior and lateral edges, (ii) pedipalp fingers with have 6 rows of granules instead of 7 as in *A. mauryi*, (iii) female pectines with 13-14 teeth, in contrast to 15-16 as in *A. mauryi*, (iv) some distinct morphometric values (see Table I). The new species is possibly an endemic element to the Atlantic forest formation.

Etymology. Patronym is in honor of Dr. Adriano Brilhante Kury of the Museu Nacional (UFRJ), Rio de Janeiro, Brazil.

Description. Based on female holotype (measurements in Table I).

Coloration. Generally yellowish with dark brown pigmented zones on the body and its appendages. Prosoma: carapace yellowish with brownish spots on the central zone, lateral and posterior edges; anterior edge with two conspicuous yellow zones; eyes surrounded by black pigment. Mesosoma: yellowish with intensely marked confluent brownish zones on the posterior and lateral edges of tergites. Metasoma: segments I to V yellowish; all segments intensely marked with light brown spots. Vesicle yellowish without spots; the base of the aculeus yellowish and the tip light reddish. Venter yellowish; sternites with diffused brownish confluent spots. Chelicerae yellowish with variegated blackish spots over the entire surface; fingers with blackish spots; teeth reddish. Pedipalps: yellowish; femur and patella with dispersed blackish-brown spots; chela hand almost entirely blackish-brown; fingers dark. Legs yellowish, with several blackish-brown spots.

Morphology. Carapace with thin but intense granulation; anterior margin not emarginated, almost straight. Anterior median superciliary and posterior median carinae weak or absent. All furrows moderate to weak. Median ocular tubercle distinctly anterior to the centre of the carapace; median eyes separated by approximately 0.8 of one ocular diameter. Three pairs of lateral eyes. Sternum subpentagonal. Mesosoma: tergites with moderately strong and intense granulation. Median carina moderately marked in all tergites. Tergite VII pentacarinate. Venter: genital operculum divided longitudinally, each plate more or less suboval in shape. Pectines: pectinal tooth count 13-13; basal middle lamellae of the pectines not dilated; fulcra absent. Sternites almost smooth; only VII is slightly granular; stigmata moderately elongate; setation weak; sternite VII with four weakly marked carinae. Metasoma: segments I to III with 10 carinae, crenulate. Segment IV with 8 carinae, crenulate. Intercarinal spaces slightly granular. Segment V slightly rounded with 5 carinae. Telson elongated and without granulations; with one ventral carina weakly marked; aculeus moderately short and

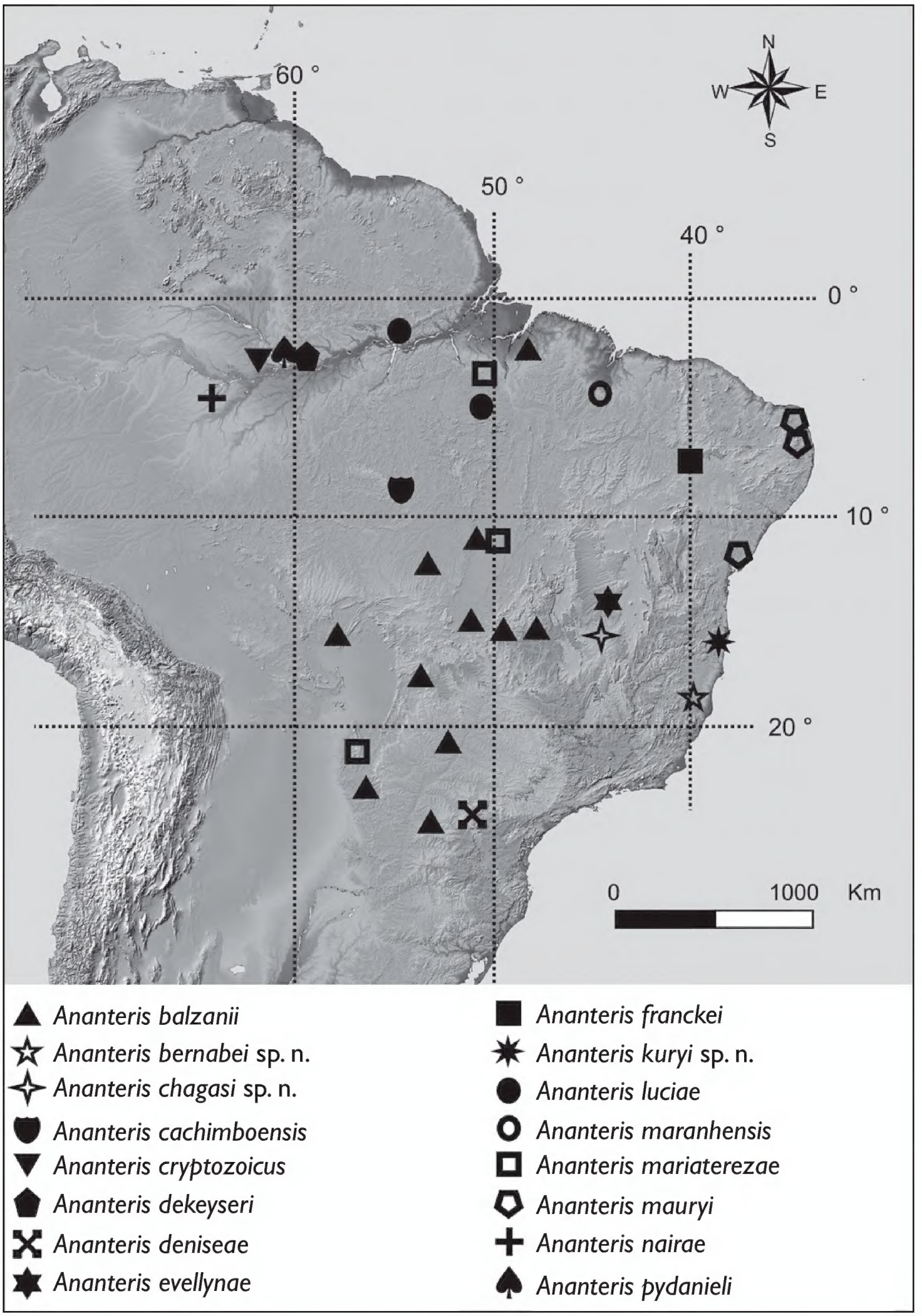


Figure 28. Map of distribution of the species of the genus *Ananteris* in Brazil.

Table I. Morphometric values (in mm) of the new *Ananteris* species described in this paper

	Ananteris chagasi	*Ananteris kuryi*	*Ananteris bernabei*
Total length	16.3	19.9	27.6
Carapace:			
- length	2.1	3.0	3.6
- anterior width	1.3	1.9	2.3
- posterior width	2.0	2.7	3.6
Metasomal segment I:			
- length	1.1	1.4	1.8
- width	1.2	1.6	2.2
Metasomal segment V:			
- length	2.6	3.8	4.6
- width	1.0	1.6	1.7
- depth	0.9	1.5	1.8
Vesicle:			
- width	0.5	1.0	1.2
- depth	0.6	0.9	1.0
Pedipalp:			
- Femur length	1.7	2.9	3.2
- Femur width	0.5	0.8	1.0
- Patella length	2.1	3.5	4.2
- Patella width	0.8	1.0	1.3
- Chela length	2.7	4.2	5.1
- Chela width	0.5	0.8	0.9
- Chela depth	0.5	0.7	0.8
Movable finger:			
- length	1.9	3.2	4.0

weakly curved; subaculear tooth strong and spinoid. Cheliceral dentition characteristic of the family Buthidae (Vachon 1963); fixed finger with two moderate basal teeth; movable finger with two weak basal teeth; ventral aspect of both finger and manus with dense, long setae. Pedipalps: femur pentacarinate; patella and chela with vestigial carinae; internal face of patella with 4/5 minute spinoid granules; all faces smooth. Fixed and movable fingers with 6 almost linear rows of granules; two small external and one internal accessory granule present at the base of each row; three granules in the extremity of the fingers; Trichobothriotaxy; orthobothriotaxy A-ß-beta (Vachon 1974, 1975). Legs: tarsus with very numerous fine median setae ventrally. Tibial spurs strongly developed on leg IV; moderate on leg III.

***Ananteris bernabei* sp. n.**
urn:lsid:zoobank.org:act:859FD1E9-018A-4EDC-8E67-B485CDAC3B77
Figs 19-28

Type material. **Female holotype**. Brazil, State of Espírito Santo, Santa Tereza, Reserva Augusto Ruschi (T. Bernabe leg.), 2006. Paratypes. 1 male (juvenile), same data as for the holotype. Both deposited in the arachnological collection of the Museu Nacional, Rio de Janeiro, Brazil (MNRJ – 11305). 1 female, Espírito Santo, Reserva Biológica (REBIO) – Sooretama, Porteira Quirinão (Exp. Arachné col.), 20/IV/2006, deposited in the Muséum national d'Histoire naturelle, Paris.

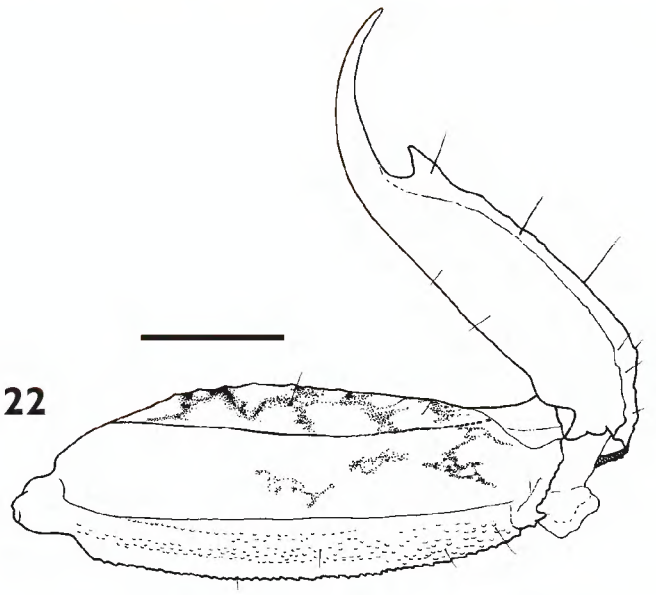
Diagnosis. Species of moderate to large size when compared with the average size of the other species of the genus (27.6 mm in total length; see Table I). General coloration yellow to reddish-yellow with variegated dark pigmentation. Pedipalps slender; fingers with 6-7 rows of granules; male and female pectines with 13-14 teeth. The new species can be distinguished from other known species of the genus, also distributed in the Atlantic Forest region of Brazil, by: (i) a paler, reddish-yellow coloration and a distinct pattern of pigmentation on the chelicerae; these are not pigmented in the central zone, (ii) pedipalp fingers with have 6-7 rows of granules, (iii) male and female pectines with 13-14 teeth, (iv) anterior margin of the carapace with a sharp and convex projection; this character is better marked in adults. The new species is possibly an endemic element to the Atlantic Forest region.

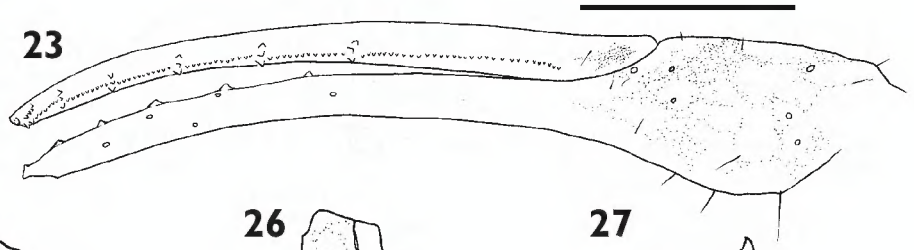
Etymology. Patronym is in honor of biologist Tiago Nascimento Bernabé.

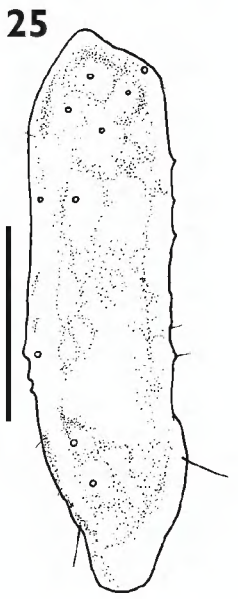
Description. Based on female holotype (measurements in Table I).

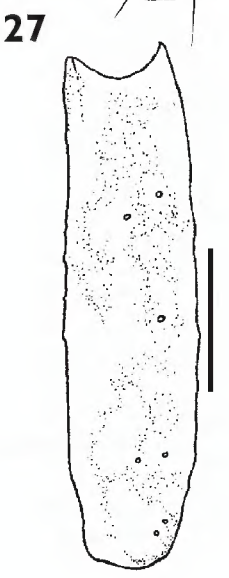
Coloration. Generally yellow to reddish-yellow with dark brown to blackish pigmented zones on the body and its appendages. Prosoma: carapace reddish-yellow with blackish-brown spots on the anterior, lateral and posterior edges; eyes surrounded by black pigment. Mesosoma: reddish-yellow with confluent blackish zones on the posterior and lateral edges of tergites. Metasoma: segments I to III yellowish; IV-V reddish-yellow; all segments intensely marked with blackish-brown spots. Vesicle reddish-yellow without any spots; the base of the aculeus reddish-yellow and the tip reddish. Venter yellowish; sternites with very diffused brownish spots. Chelicerae yellowish with variegated blackish-brown spots over almost the entire surface, with the exception of the central zone; fingers with blackish spots; teeth reddish. Pedipalps: yellowish; femur and patella with densely marked blackish-brown spots; chela hand almost entirely blackish-brown; fingers yellowish with dark on the extremities. Legs yellowish, with several blackish-brown spots.

Morphology. Carapace with coarse intense granulation; anterior margin not emarginated, almost straight, but with a sharp convex projection. Anterior median superciliary and posterior median carinae weak or absent. All furrows moderate to weak. Median ocular tubercle distinctly anterior to the centre of the carapace; median eyes separated by approximately 0.7 of one ocular diameter. Three pairs of lateral eyes. Sternum subpentagonal. Mesosoma: tergites with coarse intense granulation. Median carina moderate in all tergites. Tergite VII pentacarinate. Venter: genital operculum di-









Figures 19-27. *Ananteris barnabei* sp. n., male holotype. **19** Carapace dorsal view. **20** Pectines. **21** Chelicera, dorsal view. **22** Metasoma, segments IV-V and telson, lateral view. **23** Chela, dorsal view. **24** Manus, ventral view. **25** Pedipalpal femur, dorsal view. **26-27** Pedipalpal patella, dorsal and external view. Scale bars: 1mm.

vided longitudinally, each plate more or less sub-triangular in shape. Pectines: pectinal tooth count 14-14 in holotype; 13-13 and 14-14 in paratypes; basal middle lamellae of the pectines not dilated; fulcra absent. Sternites V to VII slightly granular; stigmata

moderately elongate; setation moderate; sternite VII more intensely granulated and with four weakly marked carinae. Metasoma: segments I and II with 10 carinae, moderately crenulate. Segments III and IV with 8 carinae, moderately crenulate. Intercarinal spaces slightly granular, almost smooth. Segment V slightly rounded with 5 carinae. Telson moderately elongated, without granulations, smooth; with one ventral carina weakly marked; aculeus short and weakly curved; subaculear tooth strong and spinoid. Cheliceral dentition characteristic of the family Buthidae (Vachon 1963); fixed finger with two moderate basal teeth; movable finger with two weak basal teeth; ventral aspect of both finger and manus with dense, long setae. Pedipalps: femur pentacarinate; patella and chela with weak to vestigial carinae; internal face of patella with 4-5 minute spinoid granules; all faces slightly granular, almost smooth. Fixed and movable fingers with 6-7 almost linear rows of granules; two small external and one internal accessory granule present at the base of each row; three granules in the extremity of the fingers; Trichobothriotaxy; orthobothriotaxy A-ß-beta (Vachon 1974, 1975). Legs: tarsus with very numerous fine median setae ventrally. Tibial spurs moderately to strongly developed on legs III and IV.

Acknowledgements

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